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Study of Oral Squamous Cell Carcinoma in Relation with Depth of Invasion and Lymph Node Metastasis

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ABSTRACT

Background: Squamous cell carcinoma of oral cavity has become one of the most common malignancies in Nepal. Neck node involvement is frequently seen in this type of malignancy. Depth of invasion is one of the most important criteria for determining further management of the patient. This study is undertaken to see whether the depth of tumor invasion is a reliable parameter for predicting regional lymph node metastasis.

Methods: This cross-sectional study was done among 85 patients of pathology department College of Medical Sciences Teaching Hospital, Bharatpur from May to October 2019.

Results: This study found that most of the cases of oral squamous cell carcinoma had occurred in old age within 60-70 years of age. The most common site of occurrence for oral squamous cell carcinoma was tongue (60%), followed by lower alveolus (20%). The depth of invasion of 5mm and more was among 89% of the cases while cervical lymph node metastasis was among 53% cases. Most of the cases (60%) were well-differentiated (Grade I). There was no statistical relationship between depth of invasion and lymph node metastasis ($p>0.05$).

Conclusions: The most common site of oral squamous cell carcinoma was tongue. Depth of invasion was not a predictor for lymph node metastasis.

Keywords: depth of invasion ; lymph node metastasis; oral squamous cell carcinoma.

INTRODUCTION

More than 90% of malignant tumors of the oral cavity are squamous cell carcinoma.[1] Males are affected more often than females because of heavier indulgence in both tobacco and alcohol habits. Globally 246,420 cases occurred in the year 2018 for oral cavity cancer. This represents 5.8% of all cancers for male and 2.3% for women.[2]

HPV16 E6 protein inactivates p53 protein suggesting that HPV and smoking might operate, in part on the same critical step-in the multistage process of carcinogenesis at these site.[1] Tobacco and alcohol appear to play a far greater role in the etiology of Head and Neck squamous cell carcinoma. The most common subsets involved are the tongue (33%) followed by the floor of the mouth (28%), palate (12%), tonsil (10%), oropharynx (10%), retromolar trigone (4%) and buccal mucosa (3%).[3] The incidence increases with age with a steep rise in the 60-65 years age group. There has been a relative increase in the number of the young patient less than 40 years.[4]

Squamous cell carcinoma of the hard palate and upper gum have a low risk of regional lymph node metastases whereas cancer of the oral tongue, the floor of the mouth and lower gum have a high risk of regional lymph node metastases.[5] Depth of invasion and lymph node metastasis are important factors for determining the further management of the patient. The aim of this research is to find the relationship between the depth of invasion and lymph node metastasis of oral squamous cell carcinoma.

METHODS

A cross-sectional analytical study was conducted among 85 cases of oral squamous cell carcinoma with radical neck dissection from May to October 2019 at the Pathology Department of College Of Medical Sciences Teaching Hospital, Bharatpur. All the oral carcinoma cases with radical neck dissection which were operated in our hospital as well as specimen received from other private hospitals were included in this study and old recurrence cases and cases without radical neck dissection were excluded. This research approval was taken from Institutional Review Committee COMS-TH IRC (Ref no.2020/039). Data was collected from the histopathology reports of the

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patients, at the department of pathology where as depth of invasions were measured microscopically in all the cases by measuring from the surface of the tumor to the deepest point of invasion. All the biopsy specimens of oral carcinoma with radical neck node dissection were fixed in 10% buffered formalin. Grossing and routine processing of these tissues were done. Staining of the tissues was done with Hematoxylin and Eosin stain. The histopathology diagnosis of all the cases was done. Tumor Staging was done by applying the AJCC Cancer staging Manual Eight Edition.[6]

Collected data was entered and analyzed using Statistical Package for Social Sciences 20. Data was analyzed by using descriptive and inferential statistics. In the descriptive statistics, mean and standard deviation were calculated for continuous variable and frequency and percentage were calculated for categorical variable. In the inferential statistics to find the association chi-square test were applied. A p-value <0.05 considered as statistically significant.

RESULTS

A total of 85 cases of oral squamous cell carcinoma who had undergone radical surgery with regional cervical neck node dissection were included in this study. The mean±SD was 53.39±12.5 years with ranged from 32 to 89 years. Also 65(76.5%) were male and 20 (23.5%) were female (Table 1). The

Table 1. Age-wise and gender-wise distribution of oral squamous cell carcinoma cases. (n=85)

Age (year)	Frequency	Percentage (%)
30-40	13	15.3
40-50	19	22.4
50-60	21	24.7
60-70	23	27.1
70-80	8	9.4
80-90	1	1.2
Gender		
Male	65	76.5
Female	20	23.5

most common site of oral squamous cell carcinoma was found to be tongue 51 cases (60%) followed by lower alveolus 17 cases (20%) whereas upper alveolus 1 case (1.2%) was the least common site of oral squamous cell carcinoma (Table 2).

Table 2. Distribution of the tumor site. (n=85)

Tumor site	Frequency	Percentage (%)
Tongue	51	60
Lower alveolus	17	20
Buccal mucosa	9	10.6
Lower GBS	5	5.9
Lower lip	2	2.4
Upper alveolus	1	1.2

Out of 85 total cases, 45 (52.9%) had cervical lymph node metastasis whereas 40 (47.1%) had no cervical lymph node metastasis. Most of the cases (60%) were well differentiated (Grade I), 33 cases (38.8%) were moderately differentiated (Grade II) and only one case (1.2%) was poorly differentiated (Grade III) (Table 3).

Table 3. Distribution of cases according to tumor differentiation (Grade). (n=85)

Tumor differentiation (Grade)	Frequency	Percentage
Well differentiated (Grade I)	51	60
Moderately differentiated (Grade II)	33	38.8
Poorly differentiated (Grade III)	1	1.2

The depth of invasion was found more in cervical lymph node metastasis cases than non-metastasis cases (93.3% VS 85.0%). However, this difference was not statistically significant (p>0.05) (Table 4).

Table 4. Relationship between depth of invasion and cervical lymph node metastasis. (n=85)

Depth of invasion	Metastasis		Chi-Square	P-value
	Present	Absent		
<5 mm	3 (6.7%)	6 (15%)	1.553	0.295
≥5mm	42 (93.3%)	34 (85%)		

DISCUSSION

Oral cancer is the sixth most common cancer worldwide.[7] More than 90% of all oral cancers are squamous cell carcinoma.[8] In our study, most of the cases of oral squamous cell carcinoma had occurred in old age group, and in males. The most common site of occurrence was tongue (60%), followed by lower alveolus (20%) and most of the cases (60%) were well differentiated (Grade I These findings were in accordance with other studies.[9-14]

In a study done by Hegde P et al., it was revealed that depth of invasion was a prognostic factor for nodal metastasis in oral squamous cell carcinoma.[15] Another study by Wermker et al., in 2015 revealed tumor extent, depth of infiltration, and grading as the most important factors of lymph node metastasis.[16] The most recent 8th edition update on American Joint Committee on Cancer Staging Manual, introduced in September 2016 revealed that depth of invasion has been included as a prognostic factor for tumor staging.[6] In contrast, our study found no statistical association between depth of invasion and lymph node metastasis (p>0.05). Similar to our study, Chaudhary N et al., also found no significant relationship seen between depth of invasion and lymph node metastasis.[17]

The limitation of this study is that recurrence cases of oral squamous cell carcinoma were not included in this study. As this study was conducted in one center, this study cannot be generalized.

CONCLUSIONS

Tongue was the most common site among the

squamous cell carcinoma of the oral cavity. The depth of invasion was not a predictor for the cervical lymph node metastasis in this study. However, we recommend that further study should be conducted taking into consideration large sample size to establish this relationship.

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